CLAIMS

1. A matched filter for implementing the correlation of an input signal and a reference signal, the matched filter comprising:

first means for storing M samples taken from N received signals, wherein N≥2, and in which samples of the input signals are stored one sample at a time at the sample frequency of the input signal;

second means for storing K M-sample long reference signals, wherein K≥1;

multiplexing means for applying one input signal and one reference signal at a time from said first and second storage means to correlation calculation means by applying alternately at least one combination of the input signal and the reference signal; and

calculation means for calculating the correlation time-dividedly for a combination of an input signal and a reference signal so that correlation results calculated from different signals appear at the output of the calculation means as a sequence.

2. A matched filter as claimed in claim 1, wherein said calculation means comprises a comparator for comparing each sample of the input signal with the corresponding sample of the reference signal and gives M 1-bit comparison results, and an adder means for summing up said M 1-bit comparison results and generating a correlation result at the output of the filter.

3. A matched filter as claimed in claim 2, wherein said comparator is one of the following: a multiplier, an XOR circuit or an XNOR circuit.

4. A matched filter for implementing the correlation of an input signal and a reference signal, the matched filter comprising:

first means for storing M samples taken from received signals and for storing samples of the input signals one sample at a time at the sample frequency of the input signal;

second means for storing K M-sample long reference signals, wherein K≥2;

multiplexing means for applying the input signal and one reference signal at a time from said first and second storage means to correlation calculation means by applying alternately at least one combination of the input signal and the reference signals to the calculation means; and

calculation means for calculating the correlation time-dividedly for

each combination of an input signal and a reference signal so that correlation results calculated from different combinations appear at the output of the calculation means as a sequence.

5. A matched filter as claimed in claim 4, wherein said calculation means comprises a comparator for comparing each sample of the input signal with the corresponding sample of the reference signal and gives M 1-bit comparison results, and an adder means for summing up said M 1-bit comparison results and generating a correlation result at the output of the filter.

6. A matched filter as claimed in claim 5, wherein said comparator is one of the following: a multiplier, an XOR circuit or an XNOR circuit.

7. A spread spectrum receiver comprising a device for detecting a demodulated signal, received by the receiver and converted into digital samples, the device comprising a matched filter for calculating the correlation between the input signal and at least one reference signal, and a controller for comparing the correlation results generated by the matched filter with a predetermined threshold value to determine if a signal is found, the matched filter comprising:

first means for storing M samples taken from N received signals, wherein $N \geq 2$, and in which samples of the input signals are stored one sample at a time at the sample frequency of the input signal;

second means for storing K M-sample long reference signals, wherein $K \geq 1$;

multiplexing means for applying one input signal and one reference signal at a time from said first and second storage means to correlation calculation means by applying alternately at least one combination of the input signal and the reference signal to the calculation means; and

calculation means for calculating the correlation time-dividedly for a combination of an input signal and a reference signal so that correlation results calculated from different signals appear at the output of the calculation means as a sequence.

8. A spread spectrum receiver as claimed in claim 7, wherein said calculation means comprises a comparator for comparing each sample of the input signal with the corresponding sample of the reference signal and gives M 1-bit comparison results, and an adder means for summing up said M 1-bit comparison results and generating a correlation result at the output of the filter.

9. A spread spectrum receiver as claimed in claim 8, wherein said comparator is one of the following: a multiplier, an XOR circuit or an XNOR circuit.

10. A spread spectrum receiver as claimed in claim 7, wherein the outputs of the matched filter are complex correlation samples, and that said device comprises a counter for squaring both components of the complex correlation sample and sums up the squared components.

11. A spread spectrum receiver as claimed in claim 10, wherein the counter sums up the correlation sample corresponding to the same phase difference of two or more input signals, the sum corresponding to a correlation result that is calculated with one phase difference and whose integration time is M·L samples, wherein M is the length of the matched filter in number of samples and L is the number of correlation samples summed up by an accumulator.

12. A spread spectrum receiver as claimed in claim 7, wherein said controller processes several comparison results corresponding to the same phase difference and reference signal, and, in response to a predetermined proportion of the gathered comparison results indicating that the output value exceeded said threshold value, declares the signal found.

13. A spread spectrum receiver comprising a device for detecting a demodulated signal, received by the receiver and converted into digital samples, the device comprising a matched filter for calculating the correlation between an input signal and at least one reference signal, and a controller for comparing the correlation results generated by the matched filter with a predetermined threshold value to determine if a signal is found, said matched filter comprising:

first means for storing M samples taken from N received signals, wherein $N \geq 1$, and in which samples of the input signals are stored one sample at a time at the sample frequency of the input signal;

second means for storing K M-sample long reference signals, wherein $K \geq 2$;

multiplexing means for applying the input signal and one reference signal at a time from said first and second storage means to correlation calculation means by applying alternately at least one combination of the input signal and the reference signals to the calculation means; and

calculation means for calculating the correlation time-dividedly for

each combination of an input signal and a reference signal so that correlation results calculated from different combinations appear at the output of the calculation means as a sequence.